REMARKS

No amendments have been made to the claims at this time.

Claims 11-16, 19, 22-27 and 29 were rejected under 35 U.S.C. § 102(b) as being anticipated by the WO 87/03886 (the Hoffman reference).

A process for preparing dispersants and a process for forming polymer polyols from these dispersants is disclosed by the Hoffman reference (WO 87/03886). This process for forming a dispersant comprises homopolymerizing a vinyl-terminated adduct or copolymerizing a vinyl-terminated adduct with at least one ethylenically unsaturated monomer, in the presence of an active hydrogen compound as a solvent in conditions such that the dispersant has a Brookfield viscosity of less than 25,000 cps (at 25°C) as a 20-35 wt.% solution of the polymer of the vinyl-terminated adduct in an active hydrogen-containing compound. See page 3, lines 15-32 and page 4, lines 24-30. The dispersants are clearly described in this reference as being soluble in the base polyol. See page 3, lines 25-26 and page 4, lines 28-29. Polymer polyols are prepared by polymerizing an ethylenically unsaturated monomer or mixture thereof, in the presence of the dispersant and a base polyol under conditions such that the polymerized monomer forms a plurality of particles which are stabilized against agglomeration by the dispersant. See page 3, lines 35-42 and page 4, lines 35-40.

It is respectfully submitted that the presently claimed pre-formed stabilizers and process for the preparation of these pre-formed stabilizers are not properly rejected as being anticipated by the dispersants formed in the Hoffman reference.

Pre-formed stabilizers of the present invention are not soluble in a base polyol. In fact, the present specification on page 2, line 19 through page 3, line 4; page 26, lines 27-31 and page 27, lines 1-8 of the present application describes pre-formed stabilizers as co-polymer dispersions which have a low solids content. These co-polymer dispersions have a small particle size which enable to these particles to act or function as seeds in preparing polymer polyols. It is therefore evident to one of ordinary skill in the art that the pre-formed stabilizers of the present invention are not soluble in a base polyol.

By comparison, the dispersants of the Hoffman reference are described as being "soluble in a base polyol" (see page 3, lines 25-26; page 4, lines 28-29; page 10, lines 1-31; page 12, lines 5-6 and lines 35-39; page 31, lines 4-14; and page 34, lines 14-21 and 34-42. This reference also expressly discloses that the "relative proportions of the vinyl-terminated adduct and the ethylenically unsaturated monomer (when used) are such that the dispersant has the required solubility" (see page 10, lines 5-10), and further that "too much of the ethylenically unsaturated monomer can cause the formation of an insoluble dispersant, which is undesirable" (see page 10, lines 19-21). Thus, it is evident that the dispersants of the Hoffman reference are soluble in a base polyol.

Applicants respectfully submit that if the presently claimed pre-formed stabilizers are identical to the dispersants of the Hoffman reference, these would either both be soluble in a base polyol or both be insoluble. The fact that Applicants' pre-formed stabilizer is insoluble in a base polyol and the dispersants of the Hoffman reference are soluble in a base polyol clearly leads one skilled in the art to conclude that these are different compositions. If these were indeed the same composition as asserted by the Examiner in maintaining this anticipation rejection, they would have the same properties, and either both be soluble or both be insoluble in a base polyol. Regardless of whether the dispersant of the Hoffman reference is formed by homopolymerizing a vinyl-terminated adduct or copolymerizing a vinyl-terminated adduct with an ethylenically unsaturated monomer (or mixture of monomers), the only useful and/or suitable dispersants described by this reference are those which are soluble in a base polyol.

Since the dispersants of the Hoffman reference are inherently different than the pre-formed stabilizers of the presently claimed invention, these can not and do not properly anticipate the pre-formed stabilizers of the invention. The difference between dispersions such as those formed by the pre-formed stabilizers of the present invention and a solution such as those formed by the dispersants in a base polyol of the Hoffman reference is readily apparent. Accordingly, the dispersants of the Hoffman reference do not properly anticipate the presently claimed pre-formed stabilizers and/or the process for preparing these pre-formed stabilizers.

Applicants further submit that even if one skilled in the art were able to make dispersants in accordance with the disclosure of the Hoffman reference that were insoluble in a base polyol, this reference leads the skilled artisan to conclude that insoluble dispersants are undesirable as it expressly discloses that "[T]he use of too much of the ethylenically unsaturated monomer can cause the formation of an insoluble dispersant, which is undesirable." (See Page 10, lines 19-21.) This leads the skilled artisan to conclude that only soluble dispersants are suitable. Why then would one skilled in the art upon reading the Hoffman reference attempt to prepare a polymer polyol from a pre-formed stabilizer in light of the fact that pre-formed stabilizers are insoluble in base polyols?

In addition, the dispersants formed in all of the working examples of the Hoffman reference are prepared from vinyl-terminated adducts which are prepared by reacting isocyanatoethyl methacrylate (IEM) with a relatively high molecular weight polyol (i.e. having a MW = 3100 to 4800, and functionality = 3). These vinyl-terminated adducts formed in the Hoffman reference do not correspond to the specified structure of the macromer required by Applicants' pre-formed stabilizers. Thus, each of the vinyl-terminated adducts of the reference is different than the macromer structure specified by the presently claimed invention. See Example 1A on page 21, lines 10-31; Example 2A on page 23, lines 11-29; Examples 3-5 on page 24, lines 37-42; Example 7 on page 26, lines 10-13; Example 8 on page 27, lines 1-3; Example 10 on page 28, lines 1-5; and Example 11 on page 29, lines 5-16. It is readily apparent that none of the vinyl-terminated adducts in the Hoffman reference corresponds to the specified structure of the macromer required by the present invention.

Each of the vinyl-terminated adducts in the Hoffman reference is then used to prepare a dispersant. See preparation of dispersants in Example 1B on page 21, line 35 through page 22, line 5; Example 2B on page 23, line 31 through page 24, line 4; Examples 3-5 on page 24, lines 43-45; Example 7 on page 26, lines 15-17; Example 8 on page 27, lines 4-6; Example 10 on page 28, lines 9-29; and Example 11 on page 29, lines 19-31. Each of these dispersants prepared in the Hoffman reference is different than the pre-formed stabilizer in the presently claimed invention. First, as set forth above, the vinyl-terminated adducts of the working examples in the

reference clearly do not correspond to the specified structure of the macromers required by the present claims. Second, it is readily apparent that the relative amounts of components used to prepare the dispersants in the Hoffman reference is different and does not overlap with the relative amounts of the components required for preparing the presently claimed pre-formed stabilizers.

More specifically, the dispersant of Example 1 of this reference was prepared from about 8.1% of a polyol, 89.8% of the vinyl-terminated adduct, 2% of monomers (SAN) and 0.2% of a catalyst (all %'s are by wt.). The dispersant of Example 2 was prepared from about 18% of a polyol, 78.1% of vinyl-terminated adduct, 2.6% of monomers (SAN) and 0.2% of a catalyst (all %'s are % by wt.). Essentially identical quantities were used in Examples 3-5 and 6-9 as in Example 2. Example 10 additionally used a chain transfer agent (carbon tetrachloride). When taking the chain transfer agent (CTA) into account, the dispersant of Example 10 was prepared from 7.4% of a polyol, 81.9% of a vinyl-terminated adduct, 5.6% monomers (SAN), 0.6% of a catalyst and 4.5% of CTA. Without the CTA, the dispersant of Example 10 was prepared from 7.8% of a polyol, 85.8% of a vinyl-terminated adduct, 5.8% monomers (SAN) and 0.6% of a catalyst. Finally, the dispersant of Example 11 was prepared from 18.3% of a polyol, 80.5% of a vinyl-terminated adduct, and 1.2% of a catalyst. No monomers (SAN) were used to prepare the dispersant in Example 11.

It is respectfully submitted that it is evident from the working examples of the Hoffman reference that the dispersants therein do not anticipate Applicants' pre-formed stabilizers. Both the process and product claims of the present application specify that the pre-formed stabilizers comprise (1) 10 to 40% by wt. of an ethylenically unsaturated macromer; (2) 10 to 30% by wt. of at least one ethylenically unsaturated monomer; (3) 0.01 to 2% of a free-radical polymerization initiator (i.e. a catalyst); and (4) 30 to 80% of a liquid diluent. One skilled in the art would know and understand that in the dispersants of this reference, it is "obvious" that the vinyl-terminated adduct is comparable to Applicants' macromer; that the styrene and/or acrylonitrile monomers are comparable to Applicants' ethylenically unsaturated monomer(s); the catalyst of the reference corresponds the free-radical initiator of the present invention; and that the polyol therein is comparable to Applicants' liquid diluent.

The dispersants of the Hoffman reference comprise (1) 78.1% to 89.7% of vinyl-terminated adduct; (2) 2 to 5.8% of styrene and/or acrylonitrile (i.e. ethylenically unsaturated monomers); (3) 0.2 to 1.2% of a catalyst; and (4) 7.4% to 18.3% of a polyol. The presently claimed pre-formed stabilizers comprise (1) 10 to 40% by weight of an ethylenically unsaturated macromer, (2) 10 to 30% by weight of at least one ethylenically unsaturated monomer, (3) 0.01 to 2% of at least one free-radical polymerization initiator, and (4) 30 to 80% by weight of a liquid diluent. Therefore, it is evident that there is no overlap between the presently claimed invention and the Hoffman reference. In fact, the Hoffman reference leads the skilled artisan to believe unsuitable dispersants result from high levels of ethylenically unsaturated monomers. The present invention, however, requires high levels of these monomers!

Applicants respectfully submit that the Hoffman reference does not disclose the presently claimed invention with the specificity of an anticipatory reference. There is no evidence that following the express disclosure of this reference would ever result in the presently claimed invention. In fact, it is Applicants' position that the express disclosure of the Hoffman reference teaches that dispersants that are insoluble in a base polyol are unsuitable for preparing polymer polyols. It also teaches that insoluble dispersants can be caused by too much of the ethylenically unsaturated monomer. See page 10, lines 19-21. Therefore, one of ordinary skill in the art would not increase the quantity of ethylenically unsaturated monomer to the presently required level in view of the Hoffman reference.

The Hoffman reference teaches away from the presently required pre-formed stabilizers. Accordingly, the presently claimed invention is not properly rejected as being anticipated by the Hoffman reference.

Applicants respectfully submit that this rejection is in error and request that it be withdrawn. The allowance of Claims 11-16, 19, 22-27 and 29 is respectfully requested.

Claims 11-16, 19 and 21-27, 29 and 31 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,013,731 (the Holeschovsky et al reference).

The Holeschovsky et al reference is discussed in the background of the present application at page 3, lines 18-21 and at page 4, lines 12-21. The stabilizer

precursors of this reference for preparing pre-formed stabilizers which contain induced unsaturation are prepared from low-intrinsic unsaturation containing polyols. Stabilizer precursors are commonly referred to as macromers or macromonomers (see column 4, lines 52-55). These may be used directly in the production of polymer polyols (column 7, lines 8-17) or in the preparation of pre-formed stabilizers. In preparing the pre-formed stabilizers of this reference, vinyl monomers are polymerized *in situ* in the stabilizer precursor (i.e. the macromer), and optionally, in the presence of a polyol or low molecular weight diluent. This results in a fine dispersion of vinyl polymer particles at relatively low solids content (see column 7, lines 18-24).

It is respectfully submitted by Applicants that of all the references relied on by the Examiner in making the rejections as set forth in the Office Action dated January 9, 2009, the Holeschovsky et al reference is the only reference that discloses and/or describes pre-formed stabilizers as they are defined in/by the present application. Thus, this is in reality, the only relevant reference cited and relied on by the Examiner in this most recent Office Action.

Although the Holeschovsky et al reference also discloses pre-formed stabilizers as in the present claims, the pre-formed stabilizers of the presently claimed invention are different than those of this reference. Thus, this reference does not properly anticipate the presently claimed invention.

More specifically, a comparison of the stabilizer precursors used to form the pre-formed stabilizers in the Holeschovsky et al reference are different than the ethylenically unsaturated macromers required by the present claims. The stabilizers of this reference are obtained from a stabilizer precursor prepared by adding induced unsaturation to a high equivalent weight, preferably multi-functional, polyoxyalkylene polyether polyol which has very low intrinsic unsaturation (see column 4, lines 50-55). A detailed discussion of "low intrinsic unsaturation" and of "induced unsaturation" is set forth in this reference at column 4, line 56 through column 7, line 8. Low intrinsic unsaturation refers to the unsaturation that unavoidably occurs during polyoxypropylation by rearrangement of reactant or product molecules to contain unsaturated sites (see column 5, lines 37-45). By comparison, induced unsaturation is unsaturation that is intentionally introduced into the polyoxyalkylene

polyether which is to be used as the stabilizer precursor (see column 5, lines 47-57). There are numerous ways to introduce this unsaturation including esterification with an unsaturated carboxylic acid or derivative thereof, reaction with another unsaturated, polyol-reactive species, reaction with molecules which contain both isocyanate functionality and a reactive unsaturated group, etc.

Suitable polyoxyalkylene polyether polyols for preparing the stabilizer precursors must have intrinsic unsaturation lower than about 0.020 meq/g (see column 4, lines 35-36 and column 5, lines 42-44) and nominal functionalities of 1 or more, preferably 2 to 8 (column 5, lines 59-60). Stabilizer precursors of this reference have, on the average, from 0.01 to 2 mol of induced unsaturation per mol of stabilizer precursor, preferably 0.05 to 1.2 mol, and most preferably 0.2 to 1 mol (see column 7, lines 4-8). These stabilizer precursors of the Holeschovsky et al reference are typically di- and higher functional materials, and may be used directly in preparing polymer polyols (column 7, lines 9-10) or following dilution with a polyol (column 7, lines 11-17).

These stabilizer precursors may also be used to produce pre-formed stabilizers (column 7, lines 18-19). Applicants submit that this portion of the Holeschovsky et al reference which describes preparing pre-formed stabilizers from the stabilizer prescursors is the most relevant part of this reference to the presently claimed invention. The preformed stabilizers therein are prepared by polymerizing vinyl monomers *in situ* in the stabilizer precursors, optionally in the presence of additional polyol and/or low molecular weight diluent to form a dispersion of vinyl polymer particles at low solids content (see column 7, lines 19-33). Although the presently claimed process for preparing the pre-formed stabilizers can be similar or the same as that of the Holeschovsky et al reference, the macromers required by the present invention are clearly different than the stabilizer precursors of this reference.

It is expressly disclosed by the Holeschovsky et al reference that the molecular weight of the stabilizer precursors varies inversely with the functionality of the low intrinsic unsaturation polyol which was used to prepare it. There is a minimum molecular weight necessary for the resultant stabilizer to be efficient (column 8, lines 39-44). In particular, the molecular weight is governed by the formula set forth at column 8, lines 45-51. A stabilizer precursor formed from a low

intrinsic unsaturation polyoxypropylene monol requires that the monol have a minimum molecular weight of about 3000 Da (column 8, lines 51-54). Stabilizer precursors prepared from low intrinsic unsaturation hexols require a minimum molecular weight of about 6000 (column 8, lines 54-56).

Applicants respectfully submit that it is evident from the structure of the presently required ethylenically unsaturated macromer (i.e. component (1) in Claims 11 and 22), that this component is always monofunctional, i.e. it contains only one (1) hydroxyl group. Thus, the only possible overlap between Applicants' claims and the Holeschovsky et al reference is when the stabilizer precursor therein is a monol.

It is readily apparent, however, that the Holeschovsky et al reference requires the molecular weight of the low intrinsic unsaturation monol to be at least 3000 Da (see column 8, lines 38-54). By comparison, the maximum molecular weight of the monofunctional compound used to prepare the ethylenically unsaturated macromer (1) required by the present invention is close to 1000. This monofunctional compound is reacted with an alkylene oxide which contains up to 8 carbon atoms. Thus, the molecular weight of the alkylene oxide component is less than the minimum molecular weight of the low intrinsic unsaturation polyol component of this reference too. Applicants respectfully submit that the Holeschovsky et al reference clearly teaches a minimum molecular weight for low intrinsic unsaturation monols. This is described as being necessary to prepare "efficient stabilizers" (column 8, lines 42-44). This molecular weight is well above the typical molecular weight of the monofunctional component and or the alkylene oxide component used to prepare the presently required ethylenically unsaturated macromers. Accordingly, the Holeschovsky et al reference does not anticipate the presently claimed invention.

The Holeschovsky et al reference further discloses that the PMPOs prepared from the precursor stabilizers described therein and pre-formed stabilizers based on these precursor stabilizers have excellent filterability, low viscosity and small particle size that can not be matched by stabilizer precursors prepared without low intrinsic unsaturation polyols of the minimum molecular weight (see column 8, lines 22-44). Applicants direct the Examiner's attention to the fact that the ethylenically unsaturated macromers of the present claims are prepared from a monofunctional

compound corresponding to a specific structure and an alkylene oxide, not a low intrinsic unsaturated monol or polyol and a vinyl monomer as required by the Holeschovsky et al reference.

All of the examples of this reference use polyoxypropylene polyols with low intrinsic unsaturation (see Examples 1-5 at column 10, line 64 through column 11, line 63). Comparative Example C1 (column 11, line 65 through column 12, line 16) used a conventional polyol that did not contain low intrinsic unsaturation. These are then used to prepare pre-formed stabilizers as described in Examples 6-10 at column 12, line 18 through column 13, line 24, which in turn are used to prepare polymer polyols (see Examples 11-16 at column 13, line 25 through column 15, line 20 and Comparative Example C2 at column 15, line 24 through column 16, line 2). It is apparent from the information set forth in Table 1 at columns 15-16 that one skilled in the art would not be motivated to use (1) a polyol (or monol) component that does not contain low intrinsic unsaturation and/or (2) a low functionality component such as a monol. The examples in this table lead the skilled artisan to conclude that viscosity increases as low intrinsic unsaturation decreases and as functionality decreases. Thus, one skilled in the art would not believe that a suitable macromer or pre-formed stabilizer could be prepared from a monofunctional compound of the specified structure and an alkylene oxide.

Furthermore, the skilled artisan would not expect that this particular combination would improve the viscosity and the 700-mesh filterability in polymer polyols prepared from such ethylenically unsaturated macromers. See Polymer Polyol Examples 4 and 5 in Table 2 on page 41 of the present application. These are prepared from Pre-formed Stabilizer 2a which was prepared from Macromer 1a. Macromer 1a in the present application contained 1 mol of induced unsaturation/mol polyol. Low intrinsic unsaturation polyols (or monols) were not used in the preparation of the macromers in the examples of the present application. Macromer 1a had a MW of about 6400 and a viscosity of about 2900 cSt at 25°C. Macromer 1b contained 0.71 mol of induced unsaturation/mol polyol, a molecular weight of about 600 and a viscosity of about 6500 cSt. Applicants respectfully submit that it is readily apparent from this that the ethylenically unsaturated macromers required by the present invention have substantially lower viscosity than conventional macromers.

In Example 2 of the present application, macromers 1a and 1b were used to prepared pre-formed stabilizers 2a and 2b, respectively. The PMPO's 3, 4 and 5 were then prepared from the pre-formed stabilizers 2b, 2a and 2a, respectively. It is evident from Table 2 on page 42 of the present application that PMPOs 4 and 5 have lower viscosity and improved filterability compared to PMPO 3. However, PMPO 3 was prepared from a pre-formed stabilizer in which the macromer was prepared from a 12000 molecular weight polyol with a functionality of 6.

In fact, PMPO's 4 and 5 have low viscosities and good filterability that are comparable to that of the PMPOs in the Holeschovsky et al reference which are prepared from stabilizer precursors prepared from low intrinsic unsaturation polyols and pre-formed stabilizers based on these stabilizer precursors. See PMPOs 11-16 in TABLE 1 at columns 15-16 of the '731 patent. This is true in spite of the fact that PMPOs 4 and 5 of the present application have slightly higher solids contents (i.e. about 50% by wt.) than the PMPOs of this reference which have solids contents of about 45% by wt. Applicants respectfully submit that this is clearly unexpected in view of the disclosure by Holeschovsky et al that the performance of stabilizers prepared from polyols having conventional levels of unsaturation can not match that of the stabilizers prepared from low intrinsic unsaturation polyols. See column 8, lines 22-38.

In spite of similarities between the process for preparing the presently claimed pre-formed stabilizers and the pre-formed stabilizers of this reference, one skilled in the art would not be motivated to make the necessary changes to the stabilizer precursors and/or reactants used to prepare these precursors in order to "arrive at" the presently required ethylenically unsaturated macromers. In fact, the Holeschovsky et al reference teaches that macromers which have "conventional" levels of intrinsic unsaturation do not match the performance of the precursors and pre-formed stabilizers they describe. Accordingly, Applicants respectfully submit that one skilled in the art is directed away from the present invention by the Holeschovsky et al reference.

Finally, Applicants' wish to clarify several statements made by the Examiner on page 4 in Section 5 of this Office Action. These statements suggest that the Examiner is misconstruing and/or misinterpreting the express disclosure of the Holeschovsky et al reference.

The first statement the Examiner made is that "Holeschovsky et al. does disclose that the stabilizer precursors may be diluted with additional polyol, wherein the polyol need not be of the low unsaturation type. See column 7, lines 9-17." Applicants' submit that this is not an accurate representation of what the Holeschovsky et al reference discloses at column 7, lines 9-17. This portion of the reference discloses that (1) the stabilizer precursors prepared therein can be used directly in the production of polymer polyols, either as prepared or following dilution with additional polyol. It then expressly states that "[I]n the latter case, the polyol diluent need not be of the low unsaturation type. Conventional base-catalyzed polyols may be used for this purpose." See column 7, lines 11-14. Applicants respectfully submit that this reference is not disclosing that a "conventional base catalyzed polyol" may be part of the stabilizer precursor, but rather can be used as a diluent when producing a polymer polyol from the stabilizer precursor. The stabilizer precursor, however, still requires the low intrinsic unsaturation polyol component.

Applicants do not disagree that these "additional polyols" may be of the "conventional type" and/or that this may correspond to the diluent, i.e. component (4) of the present claims. However, these additional polyols of the "conventional type" are not used to form the stabilizer precursor in the Holeschovsky et al reference. Nor does this reference suggest that these would be suitable for preparing stabilizer precursors.

The Examiner then continues by stating "[T]he position is taken that "low unsaturation type" encompasses polyol containing low levels of intrinsic unsaturation and polyols containing induced unsaturation, and the position is further taken that by stating that low unsaturation polyols need not be used, the reference is actually disclosing their alternative use to conventional polyols."

It is not entirely clear what the Examiner is trying to set forth as his position. However, Applicants wish to clarify their position for the record.

It is evident to one of ordinary skill in the art reading this reference that there are different types of unsaturation. As set forth above, these types of unsaturation are intrinsic unsaturation as described as column 4, line 56 through column 5, line 46; and induced unsaturation as described at column 5, line 47 through column 7, line 8. In short, intrinsic unsaturation occurs naturally due to the rearrangement of propylene oxide to allyl alcohol. To prevent this type of unsaturation, one uses DMC catalysts instead of base-catalysts in the preparation of the polyols. Induced unsaturation is unsaturation that is intentionally added into the polyoxyalkylene polyether for the stabilizer precursor by a variety of ways. The Holeschovsky et al reference requires that the polyoxyalkylene polyether polyol for preparing the stabilizer precursor have a low level of intrinsic unsaturation, i.e. about 0.020 meq/g or less (see column 5, lines 40-46), and then induces unsaturation into this polyol by, for example, esterification, amidation, or imidation, with an unsaturated carboxylic acid or derivative thereof (column 6, lines 27-30), reaction of the low intrinsic unsaturation polyol with a molecule containing both isocyanate functionality and a reactive unsaturated group such as maleic anhydride or TMI (see column 6, lines 46-65). The stabilizer precursors are described as containing (on average) from 0.01 to 2 mol of induced unsaturation per mol of stabilizer precursor (column 7, lines 4-8). Thus, this reference describes stabilizer precursors prepared from a low intrinsic unsaturation polyol component with an unsaturated component to induce unsaturation into the resultant stabilizer precursor.

Applicants wish to clarify, however, that the Holeschovsky et al reference does not state that low intrinsic unsaturation polyols do not need to be used for preparing the stabilizer precursors. The "alternative use" of conventional polyols at column 7, lines 9-17 does not relate to the preparation of the pre-formed stabilizers and/or of the stabilizer precursors. Rather, this relates to the fact that one can use a conventional polyol as a diluent in combination with a pre-formed stabilizer or stabilizer precursor as described by Holeschovsky et al to prepare a polymer polyol. Applicants respectfully submit that the diluent (i.e. conventional polyol) with a pre-formed stabilizer or stabilizer precursor does not react with the unsaturated polyol-reactive species which is used to induce unsaturation into the low intrinsic unsaturated polyol.

Accordingly, Applicants maintain their position that the presently claimed invention is not anticipated by the Holeschovsky et al reference. The presently claimed pre-formed stabilizers are not disclosed with the specificity of an anticipatory reference by Holeschovsky et al.

Furthermore, this reference teaches that lower equivalent weight polyols having conventional levels of (intrinsic) unsaturation which are prepared using conventional base catalysis do not form stabilizers which match the performance of the stabilizers of Holeschovsky et al in the preparation of polymer polyols. Thus, the skilled artisan would not expect good performance from the presently required ethylenically unsaturated macromers. It is readily apparent, however, from Table 2 of the present application that polymer polyols prepared from the pre-formed stabilizers of the present invention and the required ethylenically unsaturated macromers also exhibit low viscosity and good 700-mesh filterability.

It is respectfully submitted that this rejection is improper and Applicants request that it be withdrawn.

Claims 20, 21, 30 and 31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the WO 87/03886 (the Hoffman reference) in view of U.S. Patent 6,013,731 (the Holeschovsky et al reference).

It is respectfully submitted that combining the Hoffman reference (WO 87/03886) with the Holeschovsky et al reference (U.S. 6,013,731) does not render any of Claims 20, 21, 30 and 31 obvious under 35 U.S.C. § 103(a).

Claims 20, 21, 30 and 31 of the present application are specifically directed to the diluent which is used to prepare the claimed pre-formed stabilizers. More specifically, the diluent of the present invention is specifically either a monohydroxyl alcohol as in Claims 20 and 30, or a poly(oxypropyleneoxyethylene)polyol having an oxyethylene content of less than about 50% by weight and containing low unsaturation as in Claims 21 and 31.

As discussed above, the Hoffman reference does not disclose or suggest pre-formed stabilizers. Rather, this reference specifically discloses dispersants. By comparison, pre-formed stabilizers are clearly the subject of the present invention. As discussed above, the dispersants of the Hoffman reference are soluble in base

polyols and pre-formed stabilizers of the present invention are insoluble in base polyols. Thus, regardless of what the Holeschovsky et al reference may disclose about suitable diluents, combining these diluents with the dispersants of the Hoffman reference in preparing polymer polyols therein or using these diluents to prepare the dispersants of the Hoffman reference does not result in the invention of Claims 20, 21, 30 and/or 31. Accordingly, this combination of references does not result in the present invention, nor does it suggest the presently claimed invention to one of ordinary skill in the art.

In addition, the pre-formed stabilizers of the Holeschovsky et al reference are clearly different than the pre-formed stabilizers of the present application. See discussion above concerning differences between the stabilizers and stabilizer precursors of this reference and the stabilizers and macromers of the present invention. It is evident that the presently claimed pre-formed stabilizers and/or macromers are not disclosed or described by the Holeschovsky et al reference. Thus, regardless of what information may be disclosed about active hydrogen-containing compounds as solvents (or diluents) for preparing dispersants by the Hoffman reference, combining these active hydrogen-containing compounds with the stabilizer precursors of the Holeschovsky et al reference to prepare pre-formed stabilizers does not result in the presently claimed invention. The combination of the active hydrogen-containing compounds with the stabilizers of the Holeschovsky et al reference also does not result in Applicants' invention. This combination of references does not result in the presently claimed invention, nor does it suggest the presently claimed invention to one of ordinary skill in the art.

Applicants respectfully submit that the fact that neither the Hoffman reference or the Holeschovsky et al reference describes the presently required ethylenically unsaturated macromers which are essential to the claimed pre-formed stabilizers makes it evident that this combination of references can not properly render the presently claimed invention obvious to one of ordinary skill in the art. In the absence of a reference which clearly describes the presently required ethylenically unsaturated macromers, it is respectfully submitted that these references do not render the presently claimed invention obvious to one of ordinary skill in the art. Accordingly, the rejection of Claims 20, 21, 30 and 31 as being obvious in view of the

Hoffman reference combined with the Holeschovsky et al reference is improper and Applicants request that this rejection be withdrawn.

Claims 11-16, 19, 22-27 and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the U.S. Patent 4,680,358 (the Yu reference).

The Yu reference discloses styryl terminated macromolecular monomers of polyethers. This reference is discussed on page 6, lines 1-9 of the present application. These styryl terminated macromolecular monomers of polyethers are prepared by polymerizing (A) a cationically ring-openable cyclic ether selected from alkylene oxides and glycidyl ethers (see structures I and II at column 3, lines 34 through 65), and (B) a monoolefinically (i.e. styrylically) unsaturated primary or secondary alcohol which corresponds to structure III (see column 4, lines 1-20), in the presence of (C) a cationic initiator. The resultant macromers have the structure $R\text{-}(M)_m - OH$, in which R represents the residue of the styrylically unsaturated alcohol, M represents the residue of at least one cyclic ether which is ring-opened, and m represents an integer in the range of from 2 to 500. This reference also discloses that macromer block copolyethers can be prepared by polymerizing plural cyclic ethers sequentially, or by using a macromer as a propagator to yield compositions of structure V (column 4, lines 41-48); and random copolymers of these macromers by polymerizing macromers of structure IV or V with an olefinically unsaturated monomer to yield compositions of structure VI_a or VI_b (see column 4, lines 49-68).

Applicants respectfully submit that the present invention is not properly rejected as being obvious to one of ordinary skill in the art in view of the Yu reference.

It is respectfully submitted that the Yu reference also does not disclose or suggest pre-formed stabilizers as required by the present invention. Rather, the macromers described by Yu are disclosed as being useful as non-aqueous dispersants for sterically stabilized dispersion polymerizations since the terminally unsaturated head group anchors the dispersant by copolymerization with the monomer (e.g. acrylic acid) which is to be polymerized. See column 9, lines 8-15. These macromers may also be homopolymerized by free radical polymerization to

form a polystyrene polymer with pendant polyether chains, as comonomers in various polymerization reactions with vinyl, acrylic or diene monomer in which the styryl head group of the macromers is copolymerizable. See column 9, lines 29-38. These macromers may also be copolymerized with reactive liquid polymers (RLPs) to form various copolymers (see column 10, line 17 through column 11, line 4). It is also possible for these macromers to be connected by a diisocyanate to polyether and/or polyester diols, to be quaternized (i.e. aminated) to form oligomers, etc., and end-capping of the OH group on the macromer (see column 11, line 63 through column 12, line 59).

Applicants respectfully submit that regardless of what this reference might disclose about macromers, it does not disclose any information about pre-formed stabilizers and/or a process for preparing pre-formed stabilizers from these macromers. Nor does this reference disclose polymer polyols. The Yu reference is silent on each of these points.

It is apparent that Claims 11 and 22 of the present application require specific ranges of the required components for pre-formed stabilizers including (1) the ethylenically unsaturated macromer, (2) the ethylenically unsaturated monomer, (3) the free-radical polymerization initiator, and (4) the liquid diluent. In particular, the present invention requires from 10 to 40% by wt. of component (1), an ethylenically unsaturated macromer; from 10 to 30% by wt. of component (2), at least one ethylenically unsaturated monomer; from 0.01 to 2% by wt. of component (3), at least one catalyst; and from 30 to 80% by wt. of component (4), a liquid diluent. Applicants respectfully submit that the Yu reference does not disclose or suggest pre-formed stabilizers, a process for preparing these pre-formed stabilizers, and/or the presently required ethylenically unsaturated macromers.

In the Yu reference, Example 2 is the only portion that provides any detail into the use of these homomacromers (specifically the PECH homomacromer from Example 1) as a dispersant for the precipitation polymerization of an unsaturated monomer (e.g. acrylic acid) in a solvent (benzene). More specifically, in Example 2, 115 g of acrylic acid (an ethylenically unsaturated monomer) is polymerized in 2 g of the PECH homomacromer (dispersant) from Example 1, 0.9 g of allyl pentaerythritol (a crosslinking agent), and 620 g of benzene (a solvent), in the presence of 0.14 g of

lauroyl peroxide (a free radical initiator). This polymerization does not yield a pre-formed stabilizer as defined in the present invention. Rather, it forms a liquid polymer. This liquid polymer acts as a thickener in aqueous solutions (column 14, lines 52-61).

When considering the relative quantities of components used Example 2 of this reference in the same "terms" as required by the present invention, this example contains about 1.6% of the macromer from Example 1 (i.e. PECH homomacromer), about 15.4% of ethylenically unsaturated monomer (i.e. acrylic acid), about 0.02% of free-radical initiator, and about 82.9% of solvent. Thus, it is evident that the polymer prepared in Example 2 used a smaller amount of the macromer therein than the quantity of ethylenically unsaturated macromers that is required by the present claims. Also, the amount of solvent or diluent in this example is higher than required by the present claims.

In fact, the present invention requires that a quantity of ethylenically unsaturated macromers that is more than 6 (i.e. 6.25) times greater than that in the Yu reference. Indeed, the quantity of ethylenically unsaturated macromer in the present invention may be up to 25 times greater than the quantity of macromer used in the Yu reference. Applicants respectfully submit that although one skilled in the art may slightly vary amounts in an effort to optimize, a six-fold increase is more than a slight variation that one skilled in the art would consider when "optimizing" the Yu reference. Thus, the present invention is not suggested by the Yu reference.

Applicants respectfully submit that this reference simply does not disclose any information about pre-formed stabilizers and/or a process of preparing pre-formed stabilizers. Regardless of what information is disclosed by the Yu reference about macromers, this reference alone simply does not suggest the presently claimed invention to one of ordinary skill in the art. Accordingly, one of ordinary skill in the art has no insight into the present invention upon reading the Yu reference.

The Examiner continues to state that "[W]ith respect to the amount of solvent, the position is taken that one of ordinary skill in the art would have found it obvious to vary the amount of solvent so as to control properties such as viscosity; it has not been established that the amount of diluent utilized is critical. With respect to the amount of macromer, Yu teaches at column 10, lines 12-16 that the ratio of

ethylenically unsaturated monomer to macromer (i.e.; relative amounts of macromer to ethylenically unsatured monomer) may be varied, so as to control the properties of the resulting polymer; therefore patentee provides teaching that would motivate one to vary the amount of macromer, depending on the properties desired". See section 10 on pages 6-7 of the final Office Action dated January 19, 2008.

Applicants respectfully disagree.

It is readily apparent that the Examiner is only reading a portion of the text at column 10, lines 12-16. This part of the disclosure of Yu expressly states that "[B]y varying the ratio of conventional vinyl, acrylic, or diene to macromer (VII), and the number of ECH units in the macromer, each of the copolymers may be obtained with a wide range of properties ranging from hard plastic to soft elastomeric."

This express disclosure makes it evident that the copolymers prepared from the macromers in the Yu reference are hard plastic materials, soft elastomeric materials and everything in between. By comparison, the pre-formed stabilizers of the present invention are co-polymer dispersions which have a low solids content. These co-polymer dispersions have a small particle size which enables the particles to act as seeds in preparing polymer polyols. Pre-formed stabilizers are not soluble in base polyols. See discussion of pre-formed stabilizers in the present specification on page 2, line 19 through page 3, line 4; page 26, lines 27-31; and page 27, lines 1-8. In sum, a pre-formed stabilizer is a stable liquid dispersion of very small particles. These are "obviously" not hard plastic materials, soft elastomeric materials or anything in between!

One of ordinary skill in the art knows and understands that pre-formed stabilizers and polymer polyols prepared from pre-formed stabilizers are stable, liquids with solids dispersed therein. The broad statement by Yu that one can vary "the ratio" of unsaturated materials to macromer, etc. to yield a variety of solid materials with a wide range of properties can not properly be construed as a suggestion to prepare a stable liquid co-polymer dispersion!

Applicants respectfully submit that it is evident that the Examiner is clearly misinterpreting the Yu reference. Contrary to the Examiner's position, one skilled in the art would not vary the ratios of unsaturated materials to macromer in the Yu reference to form even a liquid material (only solid materials are disclosed therein),

much less attempt to form a stable liquid copolymer dispersion from these components! There is simply no support in the Yu reference for the position taken by the Examiner.

It is respectfully submitted that the Yu reference does not disclose or suggest any information which leads the skilled artisan to reasonably conclude or otherwise expect that macromers similar to those described therein might be suitable for preparing pre-formed stabilizers. The silence of this reference with respect to stable liquid copolymer dispersions can not simply be ignored by the Examiner.

It is Applicants' position that the only "teaching" in the Yu reference is that the macromer improves polymerization of the polymer. See column 14, lines 58-61. The dispersant prepared in Example 2 is used in an aqueous solution (see column 14, lines 52-61). A slight variation in the viscosity due to the presence/absence of the macromer in the dispersant is disclosed (e.g. 150 with macromer vs/ 400 without macromer). However, aqueous solutions prepared from these dispersants had similar viscosities (128,000 from dispersant with macromer vs. 129,000 from dispersant without macromer). See column 14, lines 52-58. Thus, this reference only teaches improved polymerization of the polymer.

Contrary to the Examiner's position, the Yu reference does not teach or suggest that ratios of unsaturated materials and macromers be varied to prepare pre-formed stabilizers. The skilled artisan would not be motivated to make the necessary changes to the described ratios, etc. of materials in the Yu reference to "arrive at" the pre-formed stabilizers of the present invention. This reference simply does not disclose or suggest the present invention to one skilled in the art.

Applicants therefore submit that the presently claimed invention is not rendered obvious to one skilled in the art by the Yu reference. It is respectfully submitted that this rejection is in error and requested that it be withdrawn.

In view of the preceding remarks, Applicants respectfully submit that each of these rejections is improper and request that they be withdrawn. The allowance of Claims 11-16, 19-27 and 29-31 is respectfully requested.

Respectfully submitted,

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